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believe. The core of the earth, if solid, must be so by reason of the pressure upon it, and a local relief of this pressure in the superficial portion due to a local uplift, would temporarily cause fusion of some of the rock, and so permit of lateral migrations. Mercalli's "inter-volcanic" type of earthquake is thus in all probability the normal one, and is connected with changes in level of the earth's surface. Wherever, therefore, portions of the continent are rapidly undergoing changes of level, and such are for the most part in the neighbourhood of the sea coast, there earthquakes must be expected.

It is vain to hope against hope that earthquakes will not return to regions which they have already visited in the past. It is quite within the range of possibility that more careful study by geologists of the rate of uplift within definite dangerous zones, may throw some light upon the future frequency and intensity of earthquakes, in those cases where historic records are insufficient for the purpose. In the writer's opinion, the study of earthquakes, from the geologist's view point, is certain to focus attention more and more upon study of the rate of oscillation of level measured in terms of wave-cutting on shores and of stream erosion as well. It was with studies of this nature that geology was concerned in its beginnings, but attention has since drifted away from the subject. There are, however, few problems of geology to-day so pregnant of important discoveries in the future.

UNIVERSITY OF MICHIGAN, May 18, 1909.

THE OPERATION OF GEOGRAPHIC FACTORS IN HISTORY.*

BY

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Man is a product of the earth surface. This means not merely that he is a child of the earth, dust of her dust; but that the earth has mothered him, fed him, set him tasks, directed his thoughts, confronted him with difficulties that have strengthened his body and sharpened his wits, given him his problems of navigation or irrigation, and at the same time whispered hints for their solution. She

* Address delivered before the Ohio Valley Historical Association at its annual meeting, Marietta Ohio, November 27, 1908.

has entered into his bone and tissue, into his mind and soul. On the mountains she has given him leg muscles of iron to climb the slope; along the coast she has left these weak and flabby, but given him instead vigorous development of chest and arm to handle his paddle or oar. In the river valley she attaches him to the fertile soil, circumscribes his ideas and ambitions by a dull round of calm, exacting duties, narrows his outlook to the cramped horizon of his farm. Up on the wind-swept plateaus, in the boundless stretch of the grasslands and the waterless tracts of the desert, where he roams with his flocks from pasture to pasture and oasis to oasis, where life knows much hardship but escapes the grind of drudgery, where the watching of grazing herd gives him leisure for contemplation, and the wide-ranging life a big horizon, his ideas take on a certain gigantic simplicity; religion becomes monotheism, God becomes one, unrivalled like the sand of the desert and the grass of the steppe, stretching on and on without break or change. Chewing over and over the cud of his simple belief as the one food of his unfed mind, his faith becomes fanaticism; his big spacial ideas, born of that ceaseless regular wandering, outgrow the land that bred them and bear their legitimate fruit in wide imperial conquests.

Man can no more be scientifically studied apart from the ground which he tills, or the lands over which he travels, or the seas over which he trades, than polar bear or desert cactus can be understood apart from its habitat. Man's relations to his environment are infinitely more numerous and complex than those of the most highly organized plant or animal. So complex are they that they constitute a legitimate and necessary object of special study. The investigation which they receive in anthropology, ethnology, sociology and history is piecemeal and partial, limited as to the race, cultural development, epoch, country or variety of geographic conditions taken into account. Hence all these sciences, together with history so far as history undertakes to explain the causes of events, fail to reach a satisfactory solution of their problems largely because the geographic factor which enters into them all has not been thoroughly analyzed. Man has been so noisy about the way he has "conquered Nature," and Nature has been so silent in her persistent influence over man, that the geographic factor in the equation of human development has been overlooked.

In every problem of history there are two main factors, variously stated as heredity and environment, man and his geographic conditions, the internal forces of race and the external forces of habitat. Now the geographic element in the long history of human develop-

ment has been operating strongly and operating persistently. Herein lies its importance. It is a stable force. It never sleeps. This natural environment, this physical basis of history, is for all intents and purposes immutable in comparison with the other factor in the problem—shifting, plastic, progressive, retrogressive man.

History tends to repeat itself largely owing to this steady, unchanging geographic element. If the ancient Roman consul in far-away Britain often assumed an independence of action and initiative unknown in the provincial governors of Gaul, and if centuries later Roman Catholicism in England maintained a similar independence towards the Holy See, both facts have their cause in the remoteness of Britain from the centre of political or ecclesiastical power in Rome. If the independence of the Roman consul in Britain was duplicated later by the attitude of the Thirteen Colonies towards England, and again within the young Republic by the headstrong self-reliance, impatient of government authority, which characterized the early Trans-Allegheny commonwealths in their aggressive Indian policy, and led them to make war and conclude treaties for the cession of land like sovereign states; and if this attitude of independence in the over-mountain men reappeared in a spirit of political defection looking towards secession from the Union and a new combination with their British neighbour on the Great Lakes or the Spanish beyond the Mississippi, these are all the identical effects of geographical remoteness made yet more remote by barriers of mountain and sea. This is the long reach which weakens the arm of authority, no matter what the race or country or epoch.

As with geographical remoteness, so it is with geographical proximity. The history of the Greek peninsula and the Greek people, because of their location at the threshold of the Orient, has contained a constantly recurring Asiatic element. This comes out most often as a note of warning; like the *motif* of Ortrud in the opera of "Lohengrin," it mingles ominously in every chorus of Hellenic enterprise or pæan of Hellenic victory, and finally swells into a national dirge at the Turkish conquest of the peninsula. It comes out in the legendary history of the Argonautic Expedition and the Trojan War; in the arrival of Phœnician Cadmus and Phrygian Pelops in Grecian lands; in the appearance of Tyrean ships on the coasts of the Peloponnesus, where they gather the purple-yielding murex and kidnap Greek women. It appears more conspicuously in the Asiatic sources of Greek culture; more dramatically in the Persian Wars, in the retreat of Xenophon's Ten Thousand, in Alexander's conquest of Asia, and Hellenic domination of Asiatic trade through Syria to

the Mediterranean. Again in the thirteenth century the lure of the Levantine trade led Venice and Genoa to appropriate certain islands and promontories of Greece as commercial bases nearer to Asia. In 1396 begins the absorption of Greece into the Asiatic empire of the Turks, the long dark eclipse of sunny Hellas, till it issues from the shadow in 1832 with the achievement of Greek independence.

If the factor is not one of geographical location, but a natural barrier, such as a mountain system or a desert, its effect is just as persistent. The upheaved mass of the Carpathians served to divide the westward moving tide of the Slavs into two streams, diverting one into the maritime plain of northern Germany and Poland, the other into the channel of the Danube valley which guided them to the Adriatic and the foot of the Alps. This same range checked the westward advance of the mounted Tartar hordes. The Alps long retarded Roman expansion into central Europe, just as they delayed and obstructed the southward advance of the northern barbarians. Only through the partial breaches in the wall known as passes did the Alps admit small, divided streams of the invaders, like the Cimbri and Teutons, who arrived, therefore, with weakened power and at intervals, so that the Roman forces had time to gather their strength between successive attacks, and thus prolonged the life of the declining empire. So in the Middle Ages, the Alpine barrier facilitated the resistance of Italy to the German emperors, trying to enforce their claim upon this ancient seat of the Holy Roman Empire.

It was by river-worn valleys leading to passes in the ridge that Etruscan trader, Roman legion, barbarian horde, and German army crossed the Alpine ranges. To-day well-made highways and railroads converge upon these valley paths and summit portals, and going is easier; but the Alps still collect their toll, now in added tons of coal consumed by engines and in higher freight rates, instead of the ancient imposts of physical exhaustion paid by pack animal and heavily accoutered soldier. Formerly these mountains barred the weak and timid; to-day they bar the poor, and forbid transit to all merchandise of large bulk and small value which can not pay the heavy transportation charges. Similarly, the wide barrier of the Rockies, prior to the opening of the first overland railroad, excluded all but strong-limbed and strong-hearted pioneers from the fertile valleys of California and Oregon, just as it excludes coal and iron even from the Colorado mines, and checks the free movement of labourers to the fields and factories of California, thereby tightening the grip of the labour unions upon Pacific coast industries.

As the surface of the earth presents obstacles, so it offers channels for the easy movement of humanity, grooves whose direction determines the destination of unknowing, unplanned migrations, and whose termini become, therefore, regions of historical importance. Along these nature-made highways history repeats itself. The maritime plain of Palestine has been an established route of commerce and war from the time of Sennacherib to Napoleon.* The Danube valley has admitted to central Europe a long list of barbarian invaders, covering the period from Attila the Hun to the Turkish besiegers of Vienna in 1683. The history of the Danube valley has been one of warring throngs, of shifting political frontiers, and unassimilated races; but as the river is a great natural highway, every neighbouring state wants to front upon it and strives to secure it as a boundary.

The movements of peoples constantly recur to these old grooves. The unmarked path of the voyageur's canoe, bringing out pelts from Lake Superior to the fur market at Montreal, is followed to-day by whaleback steamers with their cargoes of Manitoba wheat. To-day the Mohawk depression through the northern Appalachians diverts some of Canada's trade from the Great Lakes to the Hudson, just as in the seventeenth century it enabled the Dutch at New Amsterdam and later the English at Albany to tap the fur trade of Canada's frozen forests. Formerly a line of stream and portage, it carries now the Erie Canal and New York Central Railroad.† Similarly the narrow level belt of land extending from the mouth of the Hudson to the eastern elbow of the lower Delaware, defining the outer margin of the rough hill country of northern New Jersey and the inner margin of the smooth coastal plain, has been from savage days such a natural thoroughfare. Here ran the trail of the Lenni-Lenapi Indians; a little later, the old Dutch road between New Amsterdam and the Delaware trading-posts; yet later the King's Highway from New York to Philadelphia. In 1838 it became the route of the Delaware and Raritan Canal, and more recently of the Pennsylvania Railroad between New York and Philadelphia.‡

The early Aryans, in their gradual dispersion over northwestern India reached the Arabian Sea chiefly by a route running southward from the Indus-Ganges divide, between the eastern border of the Rajputana Desert and the western foot of the Aravalli Hills. The

* George Adam Smith, "Historical Geography of the Holy Land," pp. 149-157. New York, 1897.

† A. P. Brigham; "Geographic Influences in American History," Chap. I. Boston, 1903.

‡ R. H. Whitbeck, "Geographic Influences in the Development of New Jersey," *Journal of Geography*, Vol. V, No. 6. January, 1908.

streams flowing down from this range across the thirsty plains unite to form the Luni River, which draws a dead-line to the advance of the desert. Here a smooth and well-watered path brought the early Aryans of India to a fertile coast along the Gulf of Cambay.* In the palmy days of the Mongol Empire during the seventeenth century, and doubtless much earlier, it became an established trade route between the sea and the rich cities of the upper Ganges.† Recently it determined the line of the Rajputana Railroad from the Gulf of Cambay to Delhi.‡ Barygaza, the ancient seaboard terminus of this route, appears in Pliny's time as the most famous emporium of western India, the resort of Greek and Arab merchants.§ It reappears later in history with its name metamorphosed to Baroche or Broach, where in 1616 the British established a factory for trade,|| but is finally superseded, under Portuguese and English rule, by nearby Surat. Thus natural conditions fix the channels in which the stream of humanity most easily moves, determine within certain limits the direction of its flow, the velocity and volume of its current. Every new flood tends to fit itself approximately into the old banks, seeks first these lines of least resistance, and only when it finds them blocked or pre-empted does it turn to more difficult paths.

Geographical environment, through the persistence of its influence, acquires peculiar significance; its effect is not restricted to a given historical event or epoch, but unless met by some strong counteracting force, tends to make itself felt under varying guise in all succeeding history. It is the permanent element in the shifting fate of races. Islands show certain fundamental points of agreement which can be distinguished in the economic, ethnic and historical development of England, Japan, Melanesian Fiji, Polynesian New Zealand, and pre-historic Crete. The great belt of deserts and steppes extending across the Old World gives us a vast territory of rare historical uniformity. From time immemorial they have borne and bred tribes of wandering herdsmen; they have sent out the invading hordes who, in successive waves of conquest, have overwhelmed the neighbouring river lowlands of Eurasia and Africa. They have given birth in turn to Scythians, Indo-Aryans, Avars, Huns, Saracens, Tartars and Turks, as to the Tuareg tribes of the Sahara, the Sudanese and Bantu folk of the African grasslands. But whether

* Hans Helmolt, "History of the World," Vol. II, p. 372. London and New York, 1902-1906.

† Jean Baptiste Tavernier. "Travels in India," 1641-1667. Vol. I, chap. V and map. London, 1889.

‡ Sir Thomas Holdich, "India," p. 305, London, 1905.

§ Bunbury, "History of Ancient Geography," Vol. II, pp. 464-465, 469, London.

|| Imperial Gazetteer for India. Vol. III, p. 109, London, 1885.

these various peoples have been Negroes, Hamites, Semites, Indo-Europeans or Mongolians, they have always been pastoral nomads. The description given by Herodotus of the ancient Scythians is applicable in its main features to the Kirghis and Kalmuck who inhabit the Caspian plains to-day. The environment of this dry grassland operates now to produce the same mode of life and social organization as it did 2400 years ago; stamps the cavalry tribes of Cossacks as it did the mounted Huns, energizes its sons by its dry bracing air, toughens them by its harsh conditions of life, organizes them into a mobilized army, always moving with its pastoral commissariat. Then when population presses too hard upon the meager sources of subsistence, when a summer drought burns the pastures and dries up the water-holes, it sends them forth on a mission of conquest, to seek abundance in the better watered lands of their agricultural neighbours. Again and again the productive valleys of the Hoangho, Indus, Ganges, Tigris and Euphrates, Nile, Volga, Dnieper and Danube have been brought into subjection by the imperious nomads of arid Asia, just as the "hoe-people" of the Niger and upper Nile have so often been conquered by the herdsmen of the African grasslands. Thus, regardless of race or epoch—Hyksos or Kaffir—history tends to repeat itself in these rainless tracts, and involves the better watered districts along their borders when the vast tribal movements extend into these peripheral lands.

The more the comparative method is applied to the study of history—and this includes a comparison not only of different countries, but also of successive epochs in the same country—the more apparent becomes the influence of the soil in which humanity is rooted, the more permanent and necessary is that influence seen to be. Geography's claim to make scientific investigation of the physical conditions of historical events is then vindicated. "Which was there first, Geography or History?" asks Kant. And then comes his answer: "Geography lies at the basis of history." The two are inseparable. History takes for its field of investigation human events in various periods of time; anthropo-geography studies existence in various regions of terrestrial space. But all historical development takes place on the earth's surface, and therefore is more or less molded by its geographic setting. Geography, to reach accurate conclusions, must compare the operation of its factors in different historical periods and at different stages of cultural development. It, therefore, regards history in no small part as a succession of geographical factors embodied in events. Back of Massachusetts' passionate abolition movement, it sees the granitic soil and boulder-

strewn fields of New England; back of the South's long fight for the maintenance of slavery, it sees the rich plantations of tidewater Virginia and the teeming fertility of the Mississippi bottom lands. This is the significance of Herder's saying that "history is geography set into motion." What is to-day a fact of geography becomes tomorrow a factor of history. The two sciences cannot be held apart without doing violence to both, without dismembering what is a natural vital whole. All historical problems ought to be studied geographically and all geographic problems must be studied historically. Every map has its date. Those in the Statistical Atlas of the United States showing the distribution of population from 1790 to 1890 embody a mass of history as well as of geography. A map of France or the Russian Empire has a long historical perspective; and on the other hand, without that map no change of ethnic or political boundary, no modification in routes of communication, no system of frontier defences or of colonization, no scheme of territorial aggrandizement can be understood.

The study of physical environment as a factor in history was unfortunately brought into dispute by extravagant and ill-founded generalizations before it was made the object of investigation according to modern scientific methods. And even to-day principles advanced in the name of anthropo-geography are often superficial, inaccurate, based upon a body of data too limited as to space and time, or couched in terms of unqualified statement which inevitably exposes them to criticism or refutation. Investigators in this field, moreover, are prone to get a squint in their eye that makes them see one geographic factor to the exclusion of the rest; whereas it belongs to the very nature of physical environment to combine a whole group of influences, working all at the same time under the law of the resolution of forces. In this plexus of influences, some operate in one direction and some in another; now one loses its beneficent effect like a medicine long used or a garment outgrown; another waxes in power, reinforced by a new geographic factor which has been released from dormancy by the expansion of the known world, or the progress of invention and of human development.

These complex geographic influences cannot be analyzed and their strength estimated except from the standpoint of evolution. That is one reason these half-baked geographic principles rest heavy on our mental digestion. They have been formulated without reference to the all-important fact that the geographical relations of man, like his social and political organization, are subject to the law of

development. Just as the embryo state found in the primitive Saxon tribe has passed through many phases in attaining the political character of the present British Empire, so every stage in this maturing growth has been accompanied or even preceded by a steady evolution of the geographic relations of the English people.

Owing to the evolution of geographic relations, the physical environment favourable to one stage of development may be adverse to another, and *vice versa*. For instance, a small, isolated and protected habitat, like that of Egypt, Phœnicia, Crete and Greece, encourages the birth and precocious growth of civilization; but later it may cramp progress, and lend the stamp of arrested development to a people who were once the model for all their little world. Open and windswept Russia, lacking these small warm nurseries where Nature could cuddle her children, has bred upon its boundless plains a massive, untutored, homogeneous folk, fed upon the crumbs of culture that have fallen from the richer tables of Europe. But that item of area is a variable quantity in the equation. It changes its character at a higher stage of cultural development. Consequently, when the Muscovite people, instructed by the example of western Europe, shall have grown up intellectually, economically and politically to their big territory, its area will become a great national asset. Russia will come into its own, heir to a long-withheld inheritance. Many of its previous geographic disadvantages will vanish, like the diseases of childhood, while its massive size will dwarf many previous advantages of its European neighbours.

This evolution of geographic relations applies not only to the local environment, but also to the wider world relations of a people. Greeks and Syrians, English and Japanese, take a different rank among the nations of the earth to-day from that held by their ancestors 2,000 years ago, simply because the world relations of civilized peoples have been steadily expanding since those far-back days of Tyrian and Athenian supremacy. The period of maritime discoveries in the fifteenth and sixteenth centuries shifted the foci of the world relations of European states from enclosed seas to the rim of the Atlantic. Venice and Genoa gave way to Cadiz and Lagos, just as, sixteen centuries before, Corinth and Athens had yielded their ascendancy to Rome and Ostia. The keen but circumscribed trade of the Baltic, which gave wealth and historical pre-eminence to Lübeck and the other Hanse Towns of northern Germany from the twelfth to the seventeenth century, lost its relative importance when the Atlantic became the maritime field of history. Maritime leadership passed westward from Lübeck and Stralsund to Amster-

dam and Bristol, as the historical horizon widened. England, prior to this sudden dislocation, lay on the outskirts of civilized Europe, a terminal land, not a focus. The peripheral location which retarded her early development became a source of power when she accumulated sufficient density of population for colonizing enterprises, and when maritime discovery opened a way to trans-oceanic lands.*

Meanwhile, local geographic advantages in the old basins remain the same, although they are dwarfed by the development of relatively greater advantages elsewhere. The broken coastline, limited area and favourable position of Greece make its people to-day a nation of seamen, and enable them to absorb by their considerable merchant fleet a great part of the trade of the eastern Mediterranean,† just as they did in the days of Pericles; but that youthful Aegean world which once constituted so large a part of the *oekumene*, has shrunk to a modest province, and its highways to local paths. The coast cities of northern Germany still maintain a large commerce in the Baltic, but no longer hold the pre-eminence of the old Hanse Towns. The glory of the Venetian Adriatic is gone; but that the sea has still a local significance is proven by the vast sums spent by Austria and Hungary on their hand-made harbours of Trieste and Fiume.‡ The analytical geographer, therefore, while studying a given combination of geographic forces, must be prepared for a momentous readjustment and a new interplay after any marked turning point in the economic, cultural, or world relations of a people.

Skepticism as to the effect of geographic conditions upon human development is apparently justifiable, owing to the multiplicity of the underlying causes and the difficulty of distinguishing between stronger and weaker factors on the one hand, as between permanent and temporary effects on the other. We see the result, but find it difficult to state the equation producing this result. But the important thing is to avoid seizing upon one or two conspicuous geographic elements in the problem and ignoring the rest. The physical environment of a people consists of all the natural conditions to which they have been subjected, not merely a part. Geography admits no single blanket theory. The slow historical development of the Russian folk has been due to many geographic causes—to excess of cold and deficiency of rain, an outskirt location on the

* G. G. Chisholm. "The Relativity of Geographic Advantages," *Scottish Geog. Mag.* Vol. XIII, No. 9, Sept. 1897.

† Hugh Robert Mill, "International Geography," p. 347, New York, 1902.

‡ Joseph Partsch, "Central Europe," pp. 228-230. London, 1903.

Asiatic border of Europe exposed to the attacks of nomadic hordes, a meager and, for the most part, ice-bound coast which was slowly acquired, an undiversified surface, a lack of segregated regions where an infant civilization might be cradled, and a vast area of unfenced plains wherein the national energies spread out thin and dissipated themselves. The superior Baltic and Black Sea coasts, the fertility of its Ukraine soil, and location next to wide-awake Germany along the western frontier have helped to accelerate progress, but the slow-moving body carried too heavy a drag.

The law of the resolutions of forces applies in geography as in the movement of planets. Failure to recognize this fact often enables superficial critics of anthropo-geography to make a brave show of argument. The analysis of these interacting forces and of their various combinations requires careful investigation. Let us consider the interplay of the forces of land and sea apparent in every country with a maritime location. In some cases a small, infertile, niggardly country conspires with a beckoning sea to drive its sons out upon the deep; in others a wide territory with a generous soil keeps its well-fed children at home and silences the call of the sea. In ancient Phœnicia and Greece, in Norway, Finland, New England, in savage Chile and Tierra del Fuego, and the Indian coast district of British Columbia and southern Alaska, a long, broken shoreline, numerous harbours, outlying islands, abundant timber for the construction of ships, difficult communication by land, all tempted the inhabitants to a sea-faring life. While the sea drew, the land drove in the same direction. There a hilly or mountainous interior putting obstacles in the way of landward expansion, sterile slopes, a paucity of level, arable land, an excessive or deficient rainfall withholding from agriculture the rewards of tillage—some or all of these factors combined to compel the inhabitants to seek on the sea the livelihood denied by the land. Here both forces worked in the same direction.

In England conditions were much the same, and from the sixteenth century produced there a predominant maritime development which was due not solely to a long indented coastline and an exceptional location for participating in European and American trade. Its limited island area, its large extent of rugged hills and chalky soil fit only for pasturage, and the lack of a really generous natural endowment,* made it slow to answer the demands of a growing population, till the industrial development of the nineteenth century exploited its mineral wealth. So the English turned to the sea—

* H. J. Mackinder, "Britain and the British Seas," pp. 317-323. London, 1904.

to fish, to trade, to colonize. Holland's conditions made for the same development. She united advantages of coastline and position with a small infertile territory, consisting chiefly of water-soaked grazing lands. When at the zenith of her maritime development, a native authority estimated that the soil of Holland could not support more than one-eighth of her inhabitants. The meager products of the land had to be eked out by the harvest of the sea. Fish assumed an important place in the diet of the Dutch, and when a process of curing it was discovered, laid the foundation of Holland's export trade. A geographical location central to the Baltic and North Sea countries, and accessible to France and Portugal, combined with a position at the mouth of the great German rivers made it absorb the carrying trade of northern Europe.* Land and sea coöperated in its maritime development.

Often the forces of land and sea are directly opposed. If a country's geographic conditions are favourable to agriculture and offer room for growth of population, the land forces prevail, because man is primarily a terrestrial animal. Such a country illustrates what Chisholm, with Attic nicety of speech, calls "the influence of bread-power on history,"† as opposed to Mahan's sea-power. France, like England, had a long coastline, abundant harbours, and an excellent location for maritime supremacy and colonial expansion; but her larger area and greater amount of fertile soil put off the hour of a redundant population such as England suffered from even in Henry VIII's time. Moreover, in consequence of steady continental expansion from the twelfth to the eighteenth century and a political unification which made its area more effective for the support of the people, the French of Richelieu's time, except those from certain districts, took to the sea, not by national impulse as did the English and Dutch, but rather under the spur of government initiative. They therefore achieved far less in maritime trade and colonization.‡ In ancient Palestine, a long stretch of coast, poorly equipped with harbours, but accessible to the rich Mediterranean trade, failed to offset the attraction of the gardens and orchards of the Jordan valley and the pastures of the Judean hills, or to overcome the land-born predilections and aptitudes of the desert-bred Jews. Similarly, the river-fringed peninsulas of Virginia and Maryland, opening wide their doors to the incoming sea, were powerless, nevertheless, to draw the settlers away from the riotous productiveness of the

* Capt. A. T. Mahan, "Influence of Sea Power upon History," pp. 36-38. Boston, 1902.

† G. G. Chisholm, "Economic Geography," *Scottish Geog. Mag.*, March, 1908.

‡ Capt. A. T. Mahan, "Influence of Sea Power upon History," pp. 37-38. Boston, 1902.

wide tidewater plains. Here again the geographic force of the land outweighed that of the sea and became the dominant factor in directing the activities of the inhabitants.

The two antagonistic geographic forces may be both of the land, one born of a country's topography, the other of its location. Switzerland's history has for centuries shown the conflict of two political policies, one a policy of cantonal and communal independence, which has sprung from the division of that mountainous country into segregated districts, and the other one of political centralization, dictated by the necessity for co-operation to meet the dangers of Switzerland's central location mid a circle of larger and stronger neighbours. Local geographic conditions within the Swiss territory fixed the national ideal as a league of "sovereign cantons," to use the term of their constitution, enjoying a maximum of individual rights and privileges, and tolerating a minimum of interference from the central authority. Here was physical dismemberment coupled with mutual political repulsion. But a location at the meeting place of French, German, Austrian and Italian frontiers laid upon them the distasteful necessity of union within to withstand the aggressions crowding on them from without. Hence the growth of the Swiss constitution since 1798 has meant a fight of the Confederation against the canton in behalf of general rights, expanding the functions of the central government, contracting those of canton and commune.*

The geographic factors in history appear now as conspicuous direct effects of environment, such as the forest warfare of the American Indian or the irrigation works of the Pueblo tribes, now as a group of indirect effects, operating through the economic, social and political activities of a people. These remoter secondary results are often of supreme importance; they are the ones which give the final stamp to the national temperament and character, and yet in them the causal connection between environment and development is far from obvious. They have, therefore, presented pitfalls to the precipitate theorizer. He has either interpreted them as the direct effect of some geographic cause from which they were wholly divorced and thus arrived at conclusions which further investigation failed to sustain; or seeing no direct and obvious connection, he has denied the possibility of a generalization.

Montesquieu ascribes the immutability of religion, manners, customs and laws in India and other oriental countries to their warm

* Boyd Winchester, "The Swiss Republic," pp. 123, 124, 145-147. Philadelphia, 1891.

climate.* Buckle attributes a highly wrought imagination and gross superstition to all people, like those of India, living in the presence of great mountains and vast plains, knowing Nature only in its overpowering aspects, which excite the fancy and paralyze reason. He finds, on the other hand, an early predominance of reason in the inhabitants of a country like ancient Greece, where natural features are on a smaller scale, more comprehensible, nearer the measure of man himself.† The scientific geographer, grown suspicious of the omnipotence of climate and cautious of predicating immediate psychological effects which are easy to assert but difficult to prove, approaches the problem more indirectly and reaches a different solution. He finds that geographic conditions have condemned India to isolation. On the land side, a great sweep of high mountains has restricted intercourse with the interior; on the sea side, the deltaic swamps of the Indus and Ganges Rivers and an unbroken shoreline, backed by mountains on the west of the peninsula and by coastal marshes and lagoons on the east, have combined to reduce its accessibility from the ocean. The effect of such isolation is ignorance, superstition, and the early crystallization of thought and customs. Ignorance involves the lack of material for comparison, hence a restriction of the higher reasoning processes, and an unscientific attitude of mind which gives imagination free play. In contrast, the accessibility of Greece and its focal location in the ancient world made it an intellectual clearing-house for the eastern Mediterranean. The general information gathered there afforded material for wide comparison. It fed the brilliant reason of the Athenian philosopher and the trained imagination which produced the masterpieces of Greek art and literature.

Heinrich von Treitschke, in his recent "Politik," imitates the direct inference of Buckle when he ascribes the absence of artistic and poetic development in Switzerland and the Alpine lands to the overwhelming aspect of nature there, its majestic sublimity which paralyzes the mind.‡ He reinforces his position by the fact that, by contrast, the lower mountains and hill country of Swabia, Franconia and Thuringia, where nature is gentler, stimulating, appealing, and not overpowering, have produced many poets and artists. The facts are incontestable. They reappear in France in the geographical distribution of the awards made by the Paris *Salon* of 1896. Judging by these awards, the rough highlands of Savoy, Alpine Province,

* Montesquieu, "Spirit of the Laws." Book XIV, chap. IV.

† Henry Buckle, "History of Civilization in England," Vol. I, pp. 86-106.

‡ Heinrich von Treitschke, "Politik," vol. I, p. 225, Leipzig, 1897. This whole chapter on *Land und Leute* is suggestive.

the massive eastern Pyrenees, and the Auvergne plateau, together with the barren peninsula of Brittany, are singularly lacking in artistic instinct, while art flourishes in all the river lowlands of France. Moreover, Frenchmen of letters, by the distribution of their birthplaces, are essentially products of fluvial valleys, and plains, rarely of upland and mountain.*

This contrast has been ascribed to a fundamental ethnic distinction between the Teutonic population of the lowlands and the Alpine or Celtic stock which survives in the protected isolation of highland and peninsula, thus making talent an attribute of race. But the Po valley of northern Italy, whose population contains a strong infusion of this supposedly stultifying Alpine blood, and the neighbouring lowlands and hill country of Tuscany show an enormous preponderance of intellectual and artistic power over the highlands of the peninsula.† Hence the same contrast appears among different races under like geographic conditions. Moreover, in France, other social phenomena, such as suicide, divorce, decreasing birth-rate, and radicalism in politics, show this same startling parallelism of geographic distribution.‡ and these cannot be attributed to the stimulating or depressing effect of natural scenery on the human mind.

Mountain regions discourage the budding of genius because they are areas of isolation, confinement, remote from the great currents of men and ideas that move along the river valleys. They are regions of much labour and little leisure, of poverty to-day and anxiety for the morrow, of toil-cramped hands and toil-dulled brains. In the fertile alluvial plains are wealth, leisure, contact with many minds, large urban centers where commodities and ideas are exchanged. The two contrasted environments produce directly certain economic and social results, which, in turn, become the causes of secondary intellectual and artistic effects. The low mountains of central Germany which von Treitschke cites as homes of poets and artists, owing to abundant and varied mineral wealth, are the seats of active industries and dense populations,§ while their low reliefs present no serious obstacle to the numerous highways across them. They, therefore, afford all conditions for culture.

Let us take a different example. The rapid modification in physical and mental constitution of the English transplanted to North America, South Africa, Australia and New Zealand has been

* W. L. Ripley, "Races of Europe," pp. 524-525. New York, 1899.

† *Ibid.*, 526.

‡ *Ibid.*, 517-520, 533-736.

§ Joseph Partsch, "Central Europe," pp. 256-257, 268-271. London, 1903.

the result of several geographic causes working through the economic and social media; but it has been ascribed by Darwin and others to the effect of climate. The prevailing energy and initiative of colonists have been explained by the stimulating atmosphere of their new homes. Even Natal has not escaped this soft impeachment. But the enterprise of colonials has cropped out under almost every condition of heat and cold, aridity and humidity, of a habitat at sea-level and on high plateau. This blanket theory of climate cannot, therefore, cover the case. Careful analysis supersedes it by a whole group of geographic factors working directly and indirectly. The first of these was the dividing ocean, which prior to the introduction of cheap ocean transportation and bustling steerage agents, made a basis of artificial selection. Then it was the man of abundant energy who, cramped by the narrow environment of a Norwegian farm or Irish bog, came over to America to take up a quarter-section of prairie land or rise to the eminence of Boston police sergeant. The Scotch immigrants in America who fought in the Civil War were nearly two inches taller than the average in the home country.* But the ocean barrier culled superior qualities of mind and character also—independence of political and religious conviction, and the courage of those convictions, whether found in royalist or Puritan, Huguenot or English Catholic.

Such colonists in a remote country were necessarily few and could not be readily reinforced from home. Their new and isolated geographical environment favoured variation. Heredity passed on the characteristics of a small, highly selected group. The race was kept pure from intermixture with the aborigines of the country, owing to the social and cultural abyss which separated them, and to the steady withdrawal of the natives before the advance of the whites. The homogeneity of island peoples seems to indicate that individual variations are in time communicated by heredity to a whole population under conditions of isolation; and in this way modifications due to artificial selection and a changed environment become widely spread.

Nor is this all. The modified type soon becomes established, because the abundance of land at the disposal of the colonists and the consequent better conditions of living encourage a rapid increase of population. A second geographic factor of mere area here begins to operate. Ease in gaining subsistence, the greater independence of the individual and the family, emancipation from carking care, the hopeful attitude of mind engendered by the consciousness of an

* W. L. Ripley, "Races of Europe," p. 89. New York, 1899.

almost unlimited opportunity and capacity for expansion, the expectation of large returns upon labour, and, finally, the profound influence of this hopefulness upon the national character, all combined, produce a social rejuvenation of the race. New conditions present new problems which call for prompt and original solution, make a demand upon the ingenuity and resourcefulness of the individual, and therefore work to the same end as his previous removal from the paralyzing effect of custom in the old home country. Activity is youth and sluggishness or paralysis is age. Hence the energy, initiative, adaptability, and receptivity to new ideas—all youthful qualities—which characterize the Anglo-Saxon American as well as the English Africander, can be traced back to the stimulating influences, not of a bracing or variable climate, but of the abundant opportunities offered by a great, rich, unexploited country. Variation under new natural conditions, when safe-guarded by isolation, tends to produce modification of the colonial type; this is the direct effect of a changed environment. But the new economic and social activities of a transplanted people become the vehicle of a mass of indirect geographic influences which contribute most to the differentiation of the national character.

The tendency to overlook such links between conspicuous effects and their remote, less evident geographic causes has been common in geographic investigation. This direct rather than indirect approach to the heart of the problem has led to false inferences or to the assumption that reliable conclusions were impossible. Environment influences the higher, mental life of a people chiefly through the medium of their economic and social life; hence its ultimate effects should be traced through the latter back to the underlying cause. But rarely is this done. Even so astute a geographer as Strabo, though he recognizes the influence of geographic isolation in differentiating dialects and customs in Greece,* ascribes some national characteristic to the nature of the country, especially to its climate, and the others to education and institutions. He thinks that the nature of their respective lands had nothing to do with making the Athenians cultured, the Spartans and Thebans ignorant; that the predilection for natural philosophy in Babylonia and Egypt was not a result of environment but of the institutions and education of those countries.† But here arise the questions, how far custom and education in their turn depend upon environment; to what degree natural conditions, molding economic and political development, may through them fundamentally affect social customs,

* Strabo, Book VII, chap I, p. 2.

† Strabo, Book II, chap. III, p. 7.

education, culture, and the dominant intellectual aptitudes of a people. It is not difficult to see, back of the astronomy and mathematics and hydraulics of Egypt, the far off sweep of the rain-laden monsoons against the mountains of Abyssinia and the creeping of the tawny Nile flood over that river-born oasis.

Plutarch states in his "Solon" that after the rebellion of Kylon in 612 B.C. the Athenian people were divided into as many political factions as there were physical types of country in Attica. The mountaineers, who were the poorest party, wanted something like a democracy; the people of the plains, comprising the greatest number of rich families, were clamorous for an oligarchy; the coast population of the south, intermediate both in social position and wealth, wanted something between the two. The same three-fold division appeared again in 564 B.C. on the usurpation of Peisistratus.* Here the connection between geographic condition and political opinion is clear enough, though the links are agriculture and commerce. New England's opposition to the War of 1812, culminating in the threat of secession of the Hartford Convention, can be traced back through the active maritime trade to the broken coastline and unproductive soil of that glaciated country.

In all democratic or representative forms of government permitting free expression of popular opinion, history shows that division into political parties tends to follow geographical lines of cleavage. In our own Civil War the dividing line between North and South did not always run east and west. The mountain area of the Southern Appalachians supported the Union and drove a wedge of disaffection into the heart of the South. Mountainous West Virginia was politically opposed to the tidewater plains of old Virginia, because slave labour did not pay on the barren "upright" farms of the Cumberland Plateau; whereas, it was remunerative on the wide fertile plantations of the coastal lowland. The ethics of the question were obscured where conditions of soil and topography made the institution profitable. In the mountains, as also in New England, a law of diminishing financial returns had for its corollary a law of increasing moral insight. In this case, geographic conditions worked through the medium of direct economic effects to more important political and ethical results.

The roots of geographic influence often run far underground before coming to the surface, to sprout into some flowering growth; and to trace this back to its parent stem is the necessary but not easy task of the geographer.

* Plutarch, "Solon," pp. 13, 29, 154.